

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2004/001487

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. ⁷: A61M 1/12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
DWPI IPC A61M 1/10/- A61M 1/12/- + keywords (VAD, aorta, artery, cardi, ventric, assist, pump, actuator, balloon, bladder, shroud, wrap, limit, restrain and similar terms)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	WO 2002/024255 A1 (SUNSHINE HEART COMPANY PTY LTD) 28 March 2002 Pages 10-15, figures.	1-4, 6, 56, 57 15-25, 27, 29, 34, 38
X Y	US 4051840 A (KANTROWITZ et al) 4 October 1977 Whole document	1-9 15, 17, 18, 29, 38
X	WO 2000/076288 A2 (SUNSHINE HEART COMPANY PTY LTD) 21 December 2000 Pages 11-16, figures 8-10	1-6, 56, 57
X	US 4881939 A (NEWMAN) 21 November 1989 Columns 3-5, figures 8a-8b and 13a-13c	1-4, 6

☒ Further documents are listed in the continuation of Box C ☒ See patent family annex

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"B" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 1 December 2004	Date of mailing of the international search report 27 JAN 2005
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized officer Sue Thomas Telephone No : (02) 6283 2454

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2001/013974 A2 (L.VAD TECHNOLOGY INC) 1 March 2001 Pages 8-14 and figures.	3-7, 11-25, 27, 29, 38
X	US 4630597 A (KANTROWITZ et al) 23 December 1986 Whole document	42, 43, 50, 52-55
Y		4-7, 11-25, 27, 29, 34, 38
X	FR 2645739 A1 (VM TECH SA) 19 October 1990 Whole document	1-5, 8
Y		11-14
X	WO 2002/024254 A2 (IMPERIAL COLLEGE INNOVATIONS LTD) 28 March 2002 Pages 14, 15 and figures	1-4, 6, 56, 57
	US 4630597 (column 3) provides the feature of bushing to be read with Y documents WO 2002/024255, US 4051840, WO 2001/013974, FR 2645739 and US 4630597.	
	WO 2001/013974 is to be read with WO 2002/024255 for claims 19, 20, 27, 38.	

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Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☒ Claims Nos.: 58, 59
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
See extra sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

Supplemental Box

(To be used when the space in any of Boxes I to VIII is not sufficient)

Continuation of Box No: III

The International Searching Authority found multiple inventions in the present application as follows:

Group 1: Claims 1-10, 56, 57 define an actuator for a heart assist device having first and second body portions in which the first special technical features is a shroud or wrap

Group 2: Claims 11-14 define an actuator for a heart assist device having balloon first and second body portions in which the second special technical feature is a bushing

Group 3: Claims 15-41 define a heart assist device having balloon first and second body portions and both the first and second special technical features, and could be considered with either group 1 or group 2. It is noted, however, that group 1 does not include the second special feature and group 2 does not include the first special feature.

Group 4: Claims 42-55 define a flexible inflatable balloon for a blood displacing heart assist device having first and second body portions in which the third special technical feature is a connecting body portion which is adapted to maintain a radius of curvature during movement of the second body portion between deflation and inflation of the balloon.

Group 5: The scope of claim 58 is unclear because of its multiple dependencies.

Group 6: The scope of claim 59 is unclear because of its multiple dependencies.

The features held in common by the claims are a balloon having first and second body portions which does not provide novelty or inventive step for the application because these features are provided by US 4881939, WO 2002/024255 and WO 2001/013974 as examples only amongst other citations.

No other feature which could provide novelty or inventive step for the application as a whole is found common to all the groups of claims.

Consequently the application lacks unity of invention.

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
WO	2002/024255	AU	91488/01	EP	1318848	US	2004073080
US	4051840	NIL					
WO	2000/076288	AU	50548/00	BR	0011464	CA	2375962
		EP	1185319	US	2004167376		
US	4881939	NIL					
US	4630597	NIL					
WO	2001/013974	AU	69241/00	CA	2382671	EP	1207921
FR	2645739	NIL					
WO	2002/024254	AU	90088/01	BR	0114087	CA	2421812
		EP	1379294	US	2003233023		

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

END OF ANNEX